

LISTING OF CLAIMS

1. (Previously presented) A failure detecting device characterized by comprising:

notification receiving means for receiving, from at least one communication terminal of a communication partner, and outputting notification of both a reception power of a first signal transmitted from a main apparatus to said communication terminal and a transmission power of a second signal transmitted from said communication terminal to said main apparatus;

determining means for determining and outputting a reception power of said second signal transmitted from said communication terminal to said main apparatus and a transmission power of said first signal transmitted from said main apparatus to said communication terminal;

propagation loss calculating means for calculating bidirectional propagation losses between said communication terminal and said main apparatus, from said reception and transmission powers of said first signal and from said reception and transmission powers of said second signal;

difference checking means for checking whether a difference between the bidirectional propagation losses falls within a predetermined allowable range; and

failure determining means for determining that a transmitter or a receiver of at least one of said communication terminal and said main apparatus has a failure, if said difference checking means determines that the difference falls outside the predetermined allowable range, and for identifying said transmitter or receiver that has a failure based on whether the difference falls outside the allowable range, and whether a propagation loss of the propagation path to said main apparatus is smaller than a propagation loss of a propagation path to said communication terminal.

2. (Previously presented) The failure detecting device according to claim 1, characterized by further comprising a plurality of communication terminals,

wherein, for each of said plurality of communication terminals, said notification receiving means receives notification of both a reception power of a first respective signal transmitted from said main apparatus and a transmission power of a second respective signal transmitted to said main apparatus,

said determining means determines, for each communication terminal, the reception power of the second respective signal and the transmission power of the first respective signal,

said propagation loss calculating means calculates, for each communication terminal, a respective bidirectional propagation loss between each respective communication terminal and said main apparatus, from said notification of both the reception power of the first respective signal transmitted from said main apparatus and the transmission power of the second respective signal transmitted to said main apparatus from the respective communication terminal,

said difference checking means checks, for each communication terminal, whether a difference between the respective bidirectional propagation losses falls within a predetermined allowable range, and

said failure determining means determines that a transmitter or receiver of at least one of said communication terminals and main apparatus has a failure, if said difference checking means determines that the difference between the respective bidirectional propagation losses for at least one communication terminals falls outside the predetermined allowable range.

3. (Previously presented) The failure detecting device according to claim 2, characterized in that if said difference checking means determines that the difference falls outside the predetermined allowable range for all of said plurality of communication terminals, said failure determining means determines that a transmitter or a receiver of said main apparatus has a failure.

4. (Previously presented) The failure detecting device according to claim 2, characterized in that if said difference checking means determines that the difference falls outside the predetermined allowable range for at least one of said plurality of communication terminals, said

failure determining means determines that a transmitter or receiver of each of said communication terminals, which is found to fall outside the predetermined allowable range has a failure.

5. (Previously Presented) The failure detecting device according to claim 3, characterized in that if it is determined that a propagation loss of a propagation path to said main apparatus is smaller than a propagation loss of a propagation path to each communication terminal, said failure determining means determines that a transmitter of said main apparatus has failed, and, otherwise, said failure determining means determines that a receiver of said main apparatus has failed.

6. (Previously Presented) The failure detecting device according to claim 4, characterized in that if it is determined that a propagation loss of a propagation path to said main apparatus is smaller than a propagation loss of a propagation path to each communication terminal, said failure determining means determines that a receiver of a communication terminal found to fall outside the predetermined allowable range has failed, and, otherwise, said failure determining means determines that a transmitter of a communication terminal found to fall outside the predetermined allowable range has failed.

7. (Previously Presented) The failure detecting device according to claim 1, characterized in that if it is determined that a propagation loss of a propagation path to said main apparatus is equal to a propagation loss of a propagation path to each of said at least one communication terminal, said failure determining means determines that said communication terminal and main apparatus are normal.

8. (Previously Presented) The failure detecting device according to claim 1, characterized by further comprising failure notifying means for notifying said communication terminal of a detected failure.

9. (Previously presented) An apparatus for detecting a failure in a transmitter or a receiver, the apparatus comprising:

a notification receiver configured to determine a reception power of a first signal transmitted by a base station to at least one communication terminal and configured to determine a transmission power of a second signal transmitted by the communication terminal to the base station;

a determination device configured to determine a transmission power of the first signal and a reception power of the second signal;

a propagation loss calculator configured to calculate an upstream propagation loss from the communication terminal to the base station and a downstream propagation loss from the base station to the communication terminal as a function of the transmission and reception powers of the first and second signals; and

a failure determination unit configured to indicate a failure in the transmitter or the receiver if a difference between the upstream and downstream propagation losses exceeds a threshold value.

10. (Previously presented) The apparatus of claim 9, wherein the propagation loss calculator calculates the downstream propagation loss as a function of the transmission and reception powers of the first signal and calculates the upstream propagation loss as a function of the transmission and reception powers of the second signal.

11. (Previously presented) The device of claim 9, wherein the notification receiver determines the reception power of the first signal and the transmission power of the second signal based on at least one notification transmitted by the communication terminal.

12. (Previously presented) The device of claim 9, wherein the at least one communication terminal includes a plurality of communication terminals communicatively coupled to the base station via respective communication paths, and the propagation loss calculator is configured to calculate upstream and downstream propagation losses for each communication path, the failure determination unit being configured:

- (a) to determine a failure of a transmitter of the base station if differences between the upstream and downstream propagation losses for all communication paths exceed the threshold value and the downstream propagation losses exceed the upstream propagation losses for all communication paths;
- (b) to determine a failure of a receiver of the base station if the differences between the upstream and downstream propagation losses for all communication paths exceed the threshold value and the upstream propagation losses exceed the downstream propagation losses for all communication paths.

13. (Previously presented) The device of claim 12, wherein the failure determination unit is further configured:

- (a) to determine a failure of a transmitter of at least one of the communication terminals if the difference between the upstream and downstream propagation loss for at least one communication path exceeds the threshold value and the upstream propagation loss exceeds the downstream propagation loss of at least one but not all communication paths; and
- (b) to determine a failure of a receiver of at least one of the communication terminals if the difference between the upstream and downstream propagation loss for at least one communication path exceeds the threshold value and the downstream propagation loss exceeds the upstream propagation loss of at least one but not all communication paths.

14. (Previously presented) A method for detecting a failure in a transmitter or a receiver, the method comprising:

obtaining a reception power of a first signal transmitted by a base station to at least one communication terminal and a transmission power of a second signal transmitted by a communication terminal to at least one base station;

determining a transmission power of the first signal and a reception power of the second signal;

calculating an upstream propagation loss from the communication terminal to the base station and a downstream propagation loss from the base station to the communication terminal as a function of the transmission and reception powers of the first and second signals; and

detecting a failure in the transmitter or the receiver if a difference between the upstream and downstream propagation losses exceeds a threshold value.

15. (Previously presented) The method of claim 14 wherein the calculating step includes calculating the downstream propagation loss as a function of the transmission and reception powers of the first signal and calculating the upstream propagation loss as a function of the transmission and reception powers of the second signal.

16. (Previously presented) The method of claim 14, further comprising: receiving at least one notification indicating both the reception power of the first signal and the transmission power of the second signal, the obtaining step including obtaining the reception power of the first signal and the transmission power of the second signal based on the notification.